

IN THE CLAIM:

1-11 (Canceled)

12. (Previously Presented) An electrochemical sensor arrangement comprising:

a plurality of measuring heads arranged at spaced locations from each other, each of said measuring heads includes a sensor electrode array, and an operating electronic unit with an analog to digital converter connected to said array, each said operating unit also including
5 a digital to analog converter connected to said array, and a microprocessor connected to said analog to digital converter and to said digital to analog converter, said microprocessor processing signals from said array with a control algorithm to measure substance concentration at said array, said control algorithm operating said analog to digital converter and said digital to analog converter to form a potentiostat, said microprocessor, said analog
10 to digital converter and said digital to analog converter being integrated on a single chip, each of said measuring heads including a digital network interface connected to said microprocessor;

a network bus system connected to said network interface of said measuring heads;

a central unit connected to said network bus system for repetitively monitoring said
15 plurality of measuring heads.

13. (Previously Presented) A sensor arrangement in accordance with claim 12, wherein:

said network bus system is an Ethernet network.

14. (Previously Presented) A sensor arrangement in accordance with claim 12 wherein:

a power supply for said operating electronic unit is taken from said network interface.

15. (Previously Presented) A sensor arrangement in accordance with claim 12 wherein:

said network bus system is one of the Internet or an Intranet.

16. (Previously Presented) A sensor arrangement in accordance with claim 12, wherein:

said each measuring head includes a memory storing parameters of a respective said measuring head, said control algorithm of a respective said measuring head using said parameters to operate the operating unit, a respective said microprocessor repetitively measures and updates said parameters, and stores said parameters in said memory.

17. (Previously Presented) A sensor arrangement in accordance with claim 13 wherein:

a power supply for said operating electronic unit is taken from said network interface;

said network bus system is one of the Internet or an Intranet;

said each measuring head includes a memory storing parameters of a respective said measuring head, said control algorithm of a respective said measuring head using said parameters to operate, a respective said microprocessor repetitively measures and updates said parameters, and stores said parameters in said memory.